CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD

SAN FRANCISCO BAY REGION

ORDER NO. 90-066

SITE CLEANUP REQUIREMENTS FOR:

VARIAN ASSOCIATES
601 CALIFORNIA AVE.
PALO ALTO
SANTA CLARA COUNTY

STANFORD UNIVERSITY
PALO ALTO
SANTA CLARA COUNTY

The California Regional Water Quality Control Board, San Francisco Bay Region, (hereinafter called the Board), finds that:

1. Varian Associates manufactures electronic components at a site located at 601 California Avenue, Palo Alto, Santa Clara County. The land is owned by Stanford University and has been leased by Varian Associates since 1966. Varian Associates is primarily responsible for this discharge and is hereinafter called a discharger for purposes of this Order.

2. Stanford University, as landowner of the property at 601 California Avenue, is secondarily responsible for compliance with this Order.

3. Site Cleanup Requirements (Order 87-039) were adopted for this site on April 15, 1987, and on April 19, 1989 (Order 89-059). These requirements specified a schedule for site characterization and interim remediation and for the preparation of a final cleanup plan. This Order is for the purpose of scheduling additional time for the investigation of the vertical and lateral extent of waste constituent degradation of State waters, (currently undetermined), further evaluation of the local geology and hydrology, further evaluation of the rate and direction of groundwater and waste constituent migration, further evaluation of the potential impact of man-made features on groundwater and waste constituent movement, and the design and installation of interim remediation in the upper aquifer zone at the 601 California Avenue site.

4. The site consists of two main buildings as shown on Attachment 1, Site Plan, hereinafter a part of this Order. The complex houses research and production facilities for Varian Associates Electro Optical Sensors Division (formerly Image Tube Division).

5. The site is located on a series of overlapping alluvial fans deposited by east-flowing streams descending from the Santa Cruz Mountains. The site in underlain primarily by unconsolidated alluvium consisting of interbedded gravels, sands, silts and clays. The uppermost saturated zone was encountered at about 17 to 20 feet below grade. Groundwater from this site will eventually flow into San Francisco Bay.

6. The subsurface soil and groundwater at this site contain waste constituents believed to have originated from past activities at the chemical storage and use areas. Groundwater monitoring wells constructed on and offsite have detected trichloroethene (TCE), 1,1,1-trichloroethane (TCA), 1,2-dichloroethene (DCE), 1,1-dichloroethane (DCA), and other chemicals. Concentrations of TCE up to 26,000 ppb were detected in 1987 in a well near an area where TCE and other

chemicals were formerly stored.

7. There are four backup municipal wells and several private wells downgradient from the site. The closest municipal well is approximately 1/2 mile to the northeast and the closest private well is approximately 1 1/4 mile to the northeast.

8. As an interim remedial measure, the discharger in 1987 installed an extraction well and treatment system to remove volatile organic compounds (VOC's) from the groundwater in a lower A aquifer zone underneath a suspected source area. The intent of this measure was to reduce offsite migration of contaminated groundwater.

9. The former Mayfield School property is located immediately east of the Varian site. The Mayfield site was being investigated under Site Cleanup Requirements (Order 87-142, issued jointly to Varian Associates and Hewlett-Packard Company and rescinded by Order No. 89-059) which required interim remediation because of total VOC's in groundwater at concentrations greater than or equal to 1 ppm.

10. It is the Board's intent to continue groundwater remediation at the former Mayfield School site and 601 California Avenue. This Order will supersede and rescind Order 89-059.

11. The discharger submitted a remedial action plan on February 1, 1989 which was not accepted by Board staff. This plan did not address the shallow aquifer zone contamination nor the offsite plume, which has merged with waste constituents from other sources.

12. Staff comments sent with letters dated March 15, 1989 and April 14, 1989 shall be incorporated into the remedial action plan to be prepared pursuant to this Order.

13. Based on available information, the Board believes that the discharger and the Hewlett-Packard site located at 640 Page Mill Road are primarily responsible for a plume of merged chemicals, including the chemicals found beneath the former Mayfield School site. This plume is currently undefined. The Board has issued Site Cleanup Requirements to the Hewlett-Packard site at 640 Page Mill Road to investigate and propose remedial measures for their entire waste constituent plume, including the portion merged with chemicals from other sites. The Board encourages the discharger and Hewlett-Packard to jointly investigate and propose remedial measures for the merged plume area. However, if a cooperative approach cannot be arranged the discharger is still required to comply with this Order.

14. The Hewlett-Packard site at 395 Page Mill Road also appears to be adding chemicals to the plume both at that site and downgradient of it. Board staff is currently investigating other possible sources to the commingled plume downgradient of El Camino Real. Site Cleanup Requirements will be drafted for these sources as they are discovered. The Board may modify this Order to add other sites in the future and/or supply information to the discharger for their cost recovery purposes.

15. The Regional Board adopted a revised Water Quality Control Plan for the San Francisco Bay Region (Basin Plan) on December 17, 1986. The Basin Plan contains water quality objectives for South San Francisco Bay and contiguous surface and groundwaters.

16. The existing and potential beneficial uses of the groundwater underlying and adjacent to the discharger's facilities include:

a. Industrial process water supply.
b. Industrial service supply.
c. Agricultural supply.
d. Municipal and domestic supply.

17. The discharger caused or permitted waste to be discharged or deposited where it is or probably will be discharged to waters of the State and creates or threatens to create a condition of pollution or nuisance.

18. This action is an Order to enforce the laws and regulations administered by the Board. This action is categorically exempt from the provisions of CEQA pursuant to Section 15321 of the Resources Agency Guidelines.

19. The Board has notified the discharger and all interested agencies and persons of its intent under California Water Code Section 13304 to prescribe Site Cleanup Requirements for the discharges and has provided them with an opportunity for a public hearing and an opportunity to submit their written views and recommendations.

20. The Board, at a public meeting, heard and considered all comments pertaining to this discharge.

IT IS HEREBY ORDERED, pursuant to Section 13304 of the California Water Code, that the discharger shall cleanup and abate the effects described in the above findings as follows:

A. PROHIBITIONS:

1. The discharge of wastes or hazardous materials in a manner which will degrade water quality or adversely affect beneficial uses of the waters of the State is prohibited.

2. Further significant migration of waste constituents through subsurface transport to waters of the State is prohibited.

3. Activities associated with the subsurface investigation and cleanup which will cause significant adverse migration of waste constituents are prohibited.

B. SPECIFICATIONS:

1. The storage, handling, treatment or disposal of polluted soil or groundwater shall not create a nuisance as defined in Section 13050(m) of the California Water Code.

2. The discharger shall conduct monitoring activities as needed to define the local hydrogeological conditions, and the lateral and vertical extent of the soil and groundwater degradation by waste constituents. Should monitoring show evidence of

waste constituent migration, additional plume characterization shall be required.

3. The discharger shall continue interim remediation at the 601 California Avenue site until the final cleanup plan required by Provision C.2.e. of this Order is adopted by the Board.

4. The discharger shall continue interim remediation at the former Mayfield School site until the evaluation required under Order 89-059 is approved in writing by the Executive Officer.

C. PROVISIONS:

1. The discharger shall submit to the Board acceptable monitoring program reports containing the results of work performed according to a program prescribed by the Board's Executive Officer.

2. The discharger shall comply with this Order immediately upon adoption with the exceptions that Varian Associates shall comply with Prohibitions A.1., A.2., and A.3., and Specifications B.1., B.2., B.3., and B.4., as modified in accordance with the time schedule and tasks listed below. Within sixty (60) days of the Executive Officer's determination and actual notice to Stanford University that Varian Associates has failed to comply with this Order, Stanford University, as landowner, shall comply with this Order.

COMPLETION DATE/TASK:

a. COMPLETION DATE: JUNE 21, 1990.

TASK: PROPOSAL FOR INTERIM REMEDIATION OF THE UPPER AQUIFER ZONE AT 601 CALIFORNIA AVENUE: Submit a technical report acceptable to the Executive Officer which contains the technology and preliminary design for a system for interim remediation of the on-site upper water bearing zone (whether or not it is currently saturated), which is not being remediated by the current interim system. This report should include a proposal for any further investigative work needed before a system could be selected and designed, the range of alternative technologies evaluated and the results of the evaluation, justification for the selection of a interim remediation system, and a schedule for the installation of the system once approved.

b. COMPLETION DATE: JULY 29, 1990

TASK: INTERIM PROGRESS REPORT - THE LATERAL AND VERTICAL EXTENT OF WASTE CONSTITUENT MIGRATION: The discharger shall submit a technical report acceptable to the Executive Officer that describes the known vertical and lateral extent of groundwater contamination both onsite and coming from the site.

c. COMPLETION DATE: SEPTEMBER 30, 1990

TASK: SOIL AND UPPER AQUIFER REMEDIATION PLAN: The discharger shall submit a technical report acceptable to the Executive Officer which shall contain, but not be limited to, the final design of the remediation system, all data collected to date, proposed methodology to assess the effectiveness of the system once installed, the proposed dates of installation, the proposed date of start-up, and and the specific period of time to be used in later evaluations of the system.

d. COMPLETION DATE: NOVEMBER 8, 1990

TASK: INTERIM REPORT - THE LATERAL AND VERTICAL EXTENT OF THE WASTE CONSTITUENT PLUME: The discharger shall submit a technical report acceptable to the Executive Officer that describes the vertical and lateral extent of waste constituent migration both onsite and coming from the site. The report shall also include an evaluation of the zone of capture of the Oregon Expressway underpass dewatering system.

e. COMPLETION DATE: JANUARY 15, 1991.

TASK: REMEDIAL ACTION PLAN AND FEASIBILITY STUDY: Submit a technical report acceptable to the Executive Officer containing the results of the remedial investigation and the results of the feasibility study evaluating alternative final remedial measures, recommended measures necessary to achieve final cleanup objectives, and the tasks and time schedules necessary to implement the recommended final remedial measures. This report shall include the final version of the report required by Provision 2.d.

f. COMPLETION DATE: JUNE 13, 1991

TASK: INSTALLATION AND INITIAL EVALUATION OF THE ON-SITE UPPER WATER BEARING ZONE INTERIM REMEDIATION SYSTEM: Submit a technical report acceptable to the Executive Officer which shall contain, but not be limited to, all technical data collected during design of the system, the final design specifications, all data used to evaluate the effectiveness of the system and projections for constituent removal over the proposed life of the system.

All investigative work proposed by the discharger for purposes of complying with this Order, shall be submitted to and approved by the Executive Officer before work commences. These proposals may be in letter format, and shall include the data necessary to adequately evaluate the proposal. Draft technical data, e.g. copies of handwritten field boring logs or copies of chemical analysis results, shall be submitted to staff monthly or upon request. The submittal of technical reports evaluating interim and final remedial measures will include a projection of the cost, effectiveness, benefits and impact on public health, welfare and environment of each alternative measure. The remedial investigation and feasibility study shall be consistent with the guidance provided by Subpart F of the National Oil and Hazardous Substances Pollution Contingency Plan (40 CFR Part 300); Section 256356.1 (c) of the California Health and Safety Code; CERCLA guidance documents with reference to Remedial

Investigation, Feasibility Studies, and Removal Actions; and the State Water Resources Control Board's Resolution No. 68-16, "Statement of Policy with Respect to Maintaining High Quality of Waters in California".

3. If the discharger is delayed, interrupted or prevented from meeting one or more of the completion dates specified in this Order, the discharger shall promptly notify the Executive Officer and the Board may consider revision to this Order.

4. The discharger shall continue to submit to the Board monthly technical reports on compliance with the Prohibitions, Specifications, and Provisions of this Order. These reports shall consist of a letter report that, (1) summarizes work completed since submittal of the previous report, and work projected to be completed by the time of the next report, (2) identifies any obstacles which may threaten compliance with the schedule of this Order and what actions are being taken to overcome these obstacles, and (3) includes, in the event of non-compliance with Provision c.2. or any other Specification or Provision of this Order, written notification which clarifies the reasons for non-compliance and which proposes specific measures and a schedule to achieve compliance. This written notification shall identify work not completed that was projected for completion, and shall identify the impact of non-compliance on achieving compliance with the remaining requirement of this Order. These reports shall be submitted by the 15th of each month, summarizing the previous month's activities. As an alternative to the monthly report, the discharger may converse weekly by telephone with Board staff on the status of work at the site, except for instances of non-compliance with this Order.

On a quarterly basis, commencing with the report due August 17, 1990, the quarterly reports shall include, but need not be limited to, updated water table and piezometric surface maps for all affected water bearing zones, geological cross sections showing well/boring lithology, and appropriately scaled and detailed base maps showing the location of all monitoring wells and extraction wells, and identifying adjacent facilities and structures.

The discharger shall submit to the Board technical reports acceptable to the Executive Officer containing Site Safety Plans, and Site Sampling Plans.

5. The discharger shall submit to the Board technical reports acceptable to the Executive Officer. Chemical plume definition and remedial investigations shall be conducted, and technical reports prepared to meet all applicable performance goals listed below as necessary to complete the Remedial Investigation/Feasibility Study (RI/FS):

CHEMICAL ASPECTS:

1. The discharger's plume should be defined laterally and vertically by water quality measurements and for all chemicals released from the discharger's site, and their transformation products within a plume or commingled plume, at least to the level of appropriate water quality criteria. If the discharger proposes a boundary for its chemicals released from the discharger's site within a commingled plume, then the discharger shall present positive proof that all chemicals beyond the proposed boundary did not originate from the discharger's site.

2. The source of chemicals should be identified for each point of discovery.
3. The chemical, physical, and biological fate, e.g. adsorption, biodegradation, transformation, etc., should be determined for each chemical (and/or transformation product) released from the discharger's site within a plume.
4. All sampling should be done in a manner that ensures the highest degree of accuracy and precision pursuant to approved Quality Assurance Project Plans, or Site Sampling Plans.
5. The chemical distribution pattern within the saturated soil should be established to an extent sufficient to maximize remedial efficiency.

HYDROGEOLOGIC ASPECTS:

1. Lithologic units should be monitored individually so that chemical concentrations, both original chemicals and their daughter products, within each individual unit are determined.
2. The entire hydrostratigraphic unit should be adequately monitored to ensure both a representative and nondilute sample. This should occur at the plume boundaries and at other locations to provide support for investigative conclusions, and to confirm the adequacy and efficiency of remediation.
3. A sufficient number of monitoring wells should be installed to ensure that all classes of chemicals, e. g. "sinkers" versus "floaters", are detected and monitored.
4. Hydraulic interconnections, either vertical or lateral, and the effect of any interconnections on chemical movement should be documented and defined.
5. Hydraulic information for the investigative area should be of sufficient quantity and quality to maximize extraction efficiency during remediation.

GEOLOGIC ASPECTS:

1. Sampling during well, boring or piezometer installation should ensure the following:
    a. that information is obtained for 100% of the subsurface.
    b. that detailed lithologic and physical descriptions with estimates of the amount of lithologic constituents are obtained in addition to any other classification systems.
    c. that the individual chemical concentrations of each lithologic strata within the borehole are determined by a reliable and systematic manner of sampling when sampling is done to meet the above goals.
2. Hydrostratigraphic zones should be defined by documenting the existence of a significant, continuous and widespread aquitard underlying both the specific well location and the entire investigative areas. Should the hydrostratigraphic zone remain undefined because such documentation is not provided, continued vertical migration will be considered possible throughout the area and monitoring beneath the contaminated zone will be required.
3. Critical lithologic designations should be confirmed by laboratory analysis.
4. Stratigraphic correlations should be done utilizing lithologic logs in conjunction with additional data on the physical characteristics of the strata obtained from methodologies other than those used to produce the lithologic logs.

6. All hydrogeological plans, specifications, reports, and documents shall be signed by or stamped with the seal of a registered geologist, engineering geologist or professional engineer. This requirement shall not apply to monthly reports and quarterly progress reports provided the hydrogeological information contained in these reports has been submitted or is scheduled for submittal by a registered geologist, engineering geologist, or professional engineer.

7. All samples shall be analyzed by State certified laboratories or laboratories accepted by the Board using approved EPA methods for the type of analysis to be performed. All laboratories shall maintain quality assurance/quality control records for Board review.

8. The discharger shall maintain in good working order, and operate as efficiently as possible, any facility or control system installed to achieve compliance with the requirements of this Order.

9. Copies of all correspondence, reports, and documents pertaining to compliance with the Prohibitions, Specifications, and Provisions of this Order, shall be provided to the following agencies:

a. Santa Clara Valley Water District
b. Santa Clara County Health Department
c. City of Palo Alto
d. U. S. Environmental Protection Agency, Region IX T45

The Executive Officer may additionally require copies of correspondence, reports, and documents pertaining to compliance with the Prohibitions, Specifications, and Provisions of this Order to be provided to a local repository for public use and for compilation of an Administrative Record.

10. The discharger shall permit the Board or its authorized representative, in accordance with Section 13267 (c) of the California Water Code:

a. Entry upon premises in which any pollution sources exist, or may potentially exist, or in which any required records are kept, which are relevant to this Order.
b. Access to copy any records required to be kept under the terms and condition of this Order.
c. Inspection of any monitoring equipment or methodology implemented in response to this Order.
d. Sampling of any groundwater or soil which is accessible, or may become accessible, as part of any investigation or remedial action program undertaken by the discharger.

11. The discharger shall file a report on any changes in site occupancy and ownership associated with the facility described in this Order within 60 days of said changes.

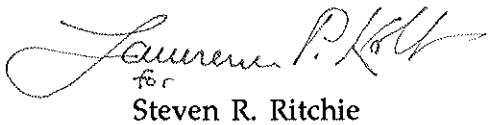
12. If any hazardous substance is discharged in or on any waters of the State, or discharged and deposited where it is, or probably will be discharged in or on any waters of the State, the discharger shall report such discharge to this Regional Board, at (415) 464-1255 on weekdays during office hours from 8 a.m. to 5 p.m., and to the Office of Emergency Services at (800) 852-

7550 during non-business hours. A written report shall be filed with the Regional Board within five (5) working days and shall contain information relative to: the nature of waste or pollutant, quantity involved, duration of incident, cause of spill, Spill Prevention, Control, and Countermeasure Plan (SPCC) in effect, if any, estimated size of affected area, nature of effects, corrective measures that have been taken or planned, and a schedule of these activities, and persons/agencies notified.

13. The Board will review this Order periodically and may revise the requirements when necessary.

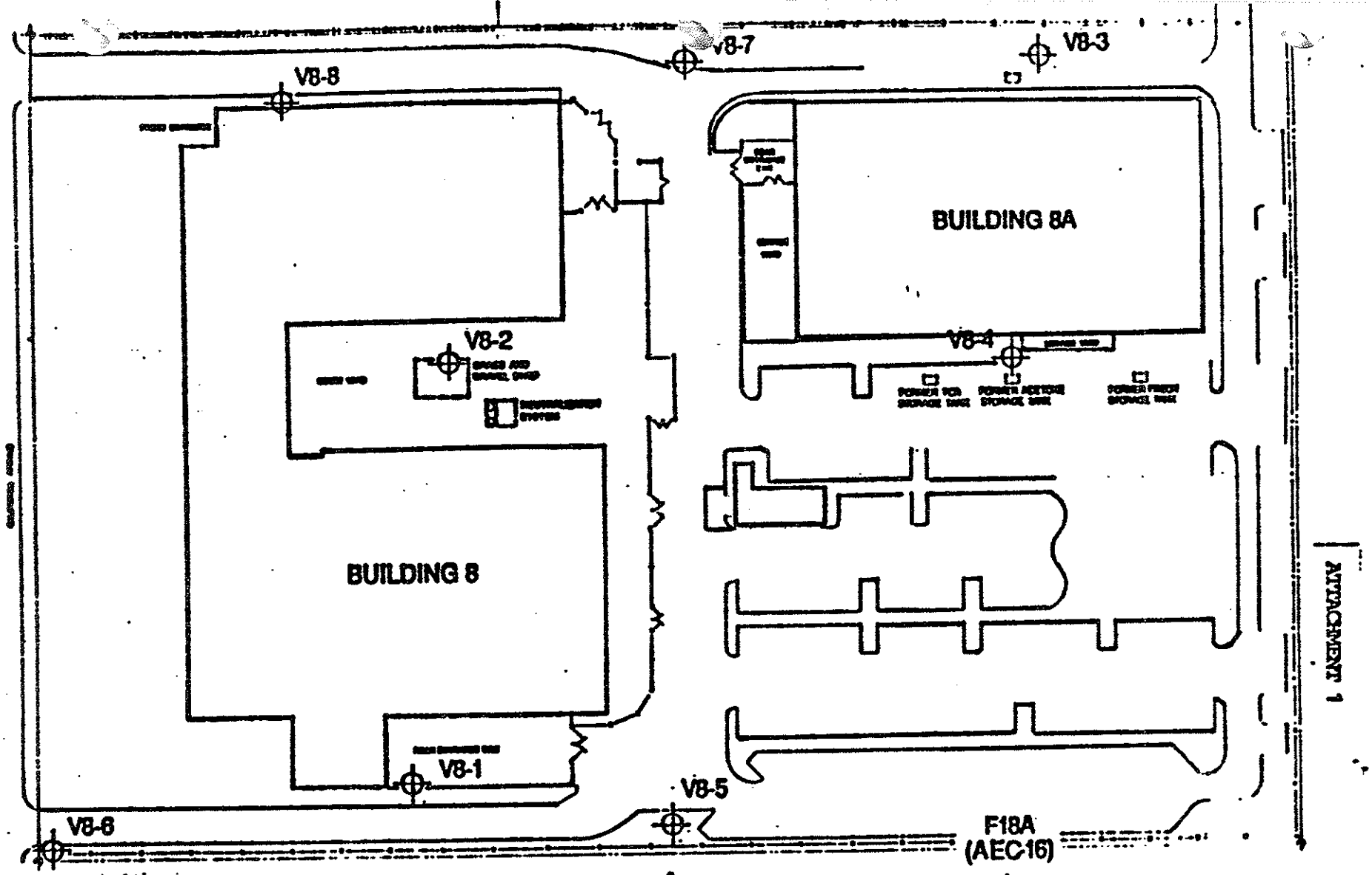
14. Regional Board Order No. 89-059 is hereby rescinded.

I, Steven R. Ritchie, Executive Officer, do hereby certify that the foregoing is a full, true and correct copy of an Order adopted by the California Regional Water Quality Control Board, San Francisco Bay Region, on May 16, 1990.



for
Steven R. Ritchie
Executive Officer

Attachments: Self-Monitoring Program
Site Plan



LEGEND

⊕ EXISTING MONITORING WELL

N

0 20 40

APPROX. GRAPHIC SCALE IN FEET

Kennedy/Jenks/Chilton

Varian Associates
601 California Ave.
Palo Alto, CA

DRAFT

Site Plan

KJ/C 6072
October 1986

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD

SAN FRANCISCO BAY REGION

VARIAN ASSOCIATES
601 CALIFORNIA AVENUE
GROUNDWATER SELF-MONITORING PROGRAM

A. GENERAL:

Reporting responsibilities of waste dischargers are specified in Section 13225(a), 13268, 13383, and 13387 (b) of the California Water Code and this Regional Board's Resolution No. 73-16.

The principal purposes of a waste discharger's monitoring program, also referred to as a self-monitoring program, are: (1) To document compliance with waste discharge requirements and prohibitions established by this Regional Board, (2) To facilitate self-policing by the waste discharger in the prevention and abatement of pollution arising from waste discharge, (3) To develop or assist in the development of effluent or other limitations, discharger prohibitions, national standards of performance, pretreatment and toxicity standards, and other standards, and (4) To prepare water and wastewater quality inventories.

B. SAMPLING AND ANALYTICAL METHODS

Sample collection, storage, and analyses shall be performed according to the EPA Method 8000 series described in "Test Methods for Evaluating Solid Wastes, Physical/Chemical Methods", dated November 1986; or other methods approved and specified by the Executive Officer of this Regional Board.

All reporting and detection limits for all analyses must be less than the state action level, or the Maximum Contaminant Level, whichever is smaller.

Turbidity measurements in NTU units shall be made immediately before a water sample is taken for chemical analysis, and the results shall be reported to the Board with the quarterly sampling data.

Chemical analyses for the following chemicals shall be done quarterly in addition to the EPA 8010 as required in Table 1.

C. REPORTS TO BE FILED WITH THE REGIONAL BOARD

1. Violations of Requirements

In the event the discharger is unable to comply with the conditions of the waste discharge requirements and prohibitions due to:

a. maintenance work, power failures, or breakdown of waste treatment equipment, or
b. accidents caused by human error or negligence, or
c. other causes such as acts of nature, or
d. poor operation or inadequate system design,

the discharger shall file a written technical report at least 15 days prior to advertising for bid on any construction project which would cause or aggravate the discharge of waste in violation of requirements; said report shall describe the nature, costs, and scheduling of all action necessary to preclude such discharge.

In addition, if the noncompliance caused by items (a), (b), (c) or (d) above is with respect to any of the Order's limits, the waste discharger shall promptly accelerate the monitoring program to weekly or as required by the Board's Executive Officer for those constituents which have been violated. Such analysis shall continue until such time as the effluent limits have been attained, or until such time as the Executive Officer dertermines to be appropriate. The results of such monitoring shall be included in the regular Self-Monitoring Report.

2. Self-Monitoring Reports

a. Sampling Period:

Sampling episodes shall be coordinated with the sites of Aydin and Varian 611 Hansen Way, Hewlett-Packard sites at 640 and 395 Page Mill Road, and any other sites in the area that may be regularly sampled in the future, such that water level elevations from all the sites are taken at the same time.

b. Reporting Period:

Written reports shall be filed regularly each quarter within forty-five days from the end of the quarter monitored.

c. Letter of Transmittal:

A letter transmitting self-monitoring reports shall accompany each report. Such a letter shall include a discussion of requirement violations found during the reporting period and actions taken or planned for correcting any requirement violation. If the discharger has previously submitted a detailed time schedule for correcting requirement violations, a reference to this correspondence will be satisfactory. Monitoring reports and the letter transmitting reports shall be signed by either a principal executive officer or his duly authorized employee. The letter shall contain a statement by the official, under penalty of perjury, that to the best of the signer's knowledge the report is true and correct.

d. Data Results:

1. Results from each required analysis and observation shall be submitted in the quarterly self-monitoring reports. GC/MS analysis shall be performed and all

peaks identified and reported on each well according to Table 1 and on each new well immediately after installation and well development. Results shall also be submitted for any additional analyses performed by the discharger at the specific request of the Board.

2. The quarterly reports shall identify the analytical procedures used for analyses directly in the report. Any special methods shall be identified and shall have prior approval of the Board's Executive Officer.

3. The currently used sampling techniques and equipment must be demonstrated, to the satisfaction of the Executive Officer, to produce the best results of all available technologies and equipment for the constituents of concern. If this is not done, a change to the techniques and equipment producing better data will be required. Justification acceptable to the Executive Officer must be given and approval obtained before the use of sampling techniques or equipment that have not been demonstrated to produce the best results of all available technology for the constituents of concern.

4. The quarterly reports shall include but not be limited to:

   a. groundwater elevations for all wells
   b. updated water table and piezometric surface maps for all affected water bearing zones
   c. geologic cross sections showing boring log lithology with the units on the sections named and correlated in accordance with the percentages of lithologic constituents and mineralogy shall be prepared. Vertical and horizontal scales should be consistent for all cross-sections. Use of vertical exaggeration in the construction of cross sections shall be limited and never more than 10 times the horizontal scale
   d. appropriately scaled and detailed base maps showing the location of all monitoring wells and extraction wells and identifying adjacent facilities and structures
   e. summary table of the results of turbidity measurements in NTU units, and the chemical analyses that includes all the data from all the wells since sampling began
   f. summary table of monitoring wells showing dates of construction, top of casing elevations, ground surface elevations, depth of boring, borehole diameter, casing diameter, depth of casing, depth of screened interval, screened lithology, and length of screen
   g. summary table showing well name, date of most recent measurement of water levels, most recent and historical water level elevation data, and screen elevation referenced to mean sea level
   h. appropriately scaled base maps each showing the latest chemical concentrations of the major chemicals of concern and the chemicals with the lowest action levels
   i. table showing the results of the latest chemical sampling round and NTU measurements
   j. copies of all technical data collected during the quarter

k. if four or more new soil borings or wells are completed during any quarter, updated geological cross sections shall be provided in the quarterly report for that quarter

l. chain of custody sheets, and laboratory sheets documenting the condition of the sample upon receipt (if not given on custody sheet)

m. Isoconcentration maps for both parent chemicals and transformation products within each hydrostratigraphic unit shall be provided to the Board

n. Potentiometric maps for each hydrostratigraphic unit shall be provided to the Board, provided adequate documentation that compatible screen elevations, screen lithologies, similar confining conditions (all confined, unconfined, or semi-confined) exist within the units, and adequate evidence that the wells used are within the same hydrostratigraphic unit has been submitted to demonstrate that potentiometric maps are appropriate at the site

o. The locations and results of samples taken for laboratory and/or field analysis shall be reported in the body of the report and the procedure used in sample collection and testing shall be described. The location of any sample tested and the results of the test shall be noted on a well, boring or piezometer log at the appropriate location

p. In addition to the other information, boring logs shall include the following data:
   1. The name of the geologist/technician who actually performs the logging.
   2. The method and type of equipment used in drilling, the type of drilling fluid used, the type of sampling device used, and blow counts.
   3. The composition of the well construction materials.
   4. Initial and stabilized water levels.
   5. Surveyed top of casing elevations, ground surface elevations, and well locations in latitude and longitude. The surveying shall be done by a licensed surveyor and shall be referenced to a first order benchmark of known latitude, longitude, and elevation.
   6. Detailed lithologic descriptions, including estimates of the amount of lithologic constituents, notes of odors, rootholes, stains, etc., in addition to Unified Soil Classification System.
   7. Screen type, composition, and location.
   8. Filter pack location and composition.
   9. Well construction details.
   10. Locations of samples taken for physical analysis to confirm the compatibility of the formation with the filter pack and screen slot size, or for any other analyses shall be noted. The results of the analyses shall be shown on the log in the appropriate location.
   11. The sample number, location of sample, how much of the sample was recovered (in inches) shall be shown on the boring log. The method used to sample shall be indicated on the boring log.
   12. Moisture content of each lithologic unit. Any variations within a unit shall be noted on the log.
   13. The scale of the log shall be at an acceptable scale and geophysical logs shall have the same scale as the lithologic logs. Tick marks

shall be made at no more than one foot intervals.

q. Purging information and physical parameter measurements collected during water quality sampling shall be included in the quarterly reports.

5. The following data shall be submitted to the Board within one month of collection, as specified, and/or upon request:

   a. Well development data, including but not limited to, the time needed for development, turbidity in NTU units at the beginning and end of development, whether the well was dewatered, and estimates of how much water was removed before dewatering.
   b. The inside depth to the bottom of a monitoring well should be periodically measured (at least once a year) and the results submitted to the Board.
   c. Copies of chromatographs shall be submitted in addition to the results of the tests for any fuel hydrocarbon compounds.
   d. Board staff shall be notified in writing and the notice shall arrive at the Board five working days in advance of the commencement of drilling, investigative and/or sampling activities. A schedule detailing which well is to be sampled/drilled at which time shall be included in the written notification. Board staff shall be promptly notified of any changes in the schedule.
   e. All data submitted to the Board shall have the well, boring, piezometer, or other location designation clearly marked on all data sheets. The date and time the sample is collected, delivered to the laboratory, analyzed, and reported shall be included on each laboratory data sheet. The depth the sample was taken shall be included on all data sheets for soil boring samples. (legible handwriting is acceptable).
   f. All maps and diagrams submitted to the Board shall only show the location of the data that was used in the preparation of the map or diagram, with the exception of well location maps.

6. Varian Associates shall describe, in the quarterly Self-Monitoring Report, the reasons for significant increases in a waste constituent at a well. The description shall include, but not be limited to:

   a. the source of the increase
   b. how Varian Associates determined or will determine the source of the increase, and
   c. what source removal measures have been completed or will be proposed.

7. Original lab results shall be retained and shall be made available for inspection for three years after origination or until after all continuing or impending legal or administrative actions are resolved.

8. The quarterly reports shall include a discussion of unexpected operational changes which could affect performance of the extraction system, such as flow fluctuations, maintenance shutdown, etc.

9. Varian Associates shall describe in the quarterly monitoring report the effectiveness of the actions taken to regain compliance if compliance is not achieved. The effectiveness evaluation shall include the basis of determing the effectiveness.

10. Varian Associates shall submit the results of any testing of effluent from the extraction wells.

11. An annual report shall be combined with the fourth quarter regular report and shall include cumulative data for each well. The annual report shall also include minimum, maximum, median, and average water quality and water level elevation data for the year.

e. Self-Monitoring Report Revisions:

Additional long term or temporary changes in the sample collection frequency, sampling techniques or requirements, and routine chemical analysis may become warrented as monitoring needs change. These changes shall be based on the following criteria and shall be proposed in a quarterly self-monitoring report. The changes shall be implemented only upon receipt of written approval from Board staff.

Criteria for revision:

1. Discontinued analysis for a routine chemical parameter for a specific well after a one year period of below detection limit values for that parameter.
2. Changes in the sampling frequency for a specific well after a one year period of below detection limit values for all waste constituents from that well.
3. Temporary increases in sampling frequency or changes in requested chemical parameters for a well or groups of wells because of a change in data needs (e.g., evaluating groundwater extraction effectiveness or other remediation strategies).
4. Alteration of sampling frquency based on evaluation of collective data base.

D. DESCRIPTION OF SAMPLING STATIONS

GROUNDWATER

STATIONS	DESCRIPTION
Listed in Table 1	Monitoring wells

E. SCHEDULE OF SAMPLING AND ANALYSIS

The schedule of sampling and analysis shall be given in Table 1.

I, Steven R. Ritchie, Executive Officer, hereby certify that the foregoing Self-Monitoring Program:

1. Has been developed in accordance with the procedure set forth in this Regional Board's Resolution No. 73-16 in order to obtain data established in Regional Board Order No. 90-066.

2. Is effective on the date shown below.

3. May be reviewed at any time subsequent to the effective date upon written notice from the Executive Officer or request from the discharger and revisions will be ordered by the Executive Officer.

for Steven R. Ritchie
Executive Officer

Effective Date: May 16, 1990
Attachments: Table 1

TABLE I

STATION	FREQUENCY	ANALYSIS	EXTRA CHEMICALS	YEARLY TEST
V8-1	QUARTERLY	8010 G		8240
V8-2	QUARTERLY	8010 G		8240
V8-3	QUARTERLY	8010 G	SET A	8240
V8-3A1	QUARTERLY	8010 G	SET A	8240
V8-5	QUARTERLY	8010 G	SET A	8240
V8-7	QUARTERLY	8010 G	SET A	8240
V8-7A1	QUARTERLY	8010 G	SET A	8240
V8-8	QUARTERLY	8010 G	SET A	8240
V-9	QUARTERLY	8010 G	SET A	8240
V8-9A1	QUARTERLY	8010 G	SET A	8240
F22A1	QUARTERLY	8010 G	SET A	8240
F36A2	QUARTERLY	8010 G	SET C	8240
F39A2	QUARTERLY	8010 G	SET C	8240
F46A2	QUARTERLY	8010 G	SET C	8240
F61A1	QUARTERLY	8010 G	SET C	8240
F62A2	QUARTERLY	8010 G	SET C	8240
F65A1	QUARTERLY	8010 G	SET C	8240
F66A2	QUARTERLY	8010 G	SET C	8240
V8-2X	BIANUALLY	8010 G	SET A	8240
V8-4	BIANUALLY	8010 G	SET D	8240
V8-10	BIANUALLY	8010 G	SET A	8240
V8-13B	BIANUALLY	8010 G	SET A	8240
F18A	BIANUALLY	8010 G	SET A	8240

LEGEND
G = GRAB SAMPLE
SET A = TOLUENE, BENZENE, ETHYLBENZENE, FREON 113
SET B = TOLUENE, ETHYLBENZENE, XYLENE, FREON 113, ACETONE, DICHLOROMETHANE
SET C = TOLUENE, BENZENE, ETHYLBENZENE, FREON 113, XYLENE, ACETONE, DICHLOROMETHANE
SET D = FREON 113

EPA 8010/8020 NOT REQUIRED WHEN EPA 8240 IS PERFORMED
EPA 8240 SHALL BE PERFORMED WITH AN OPEN SCAN
EPA 8010/8020 FOR: PURGEABLE PRIORITY POLLUTANTS